

The following conclusions may be drawn from the results obtained in these experiments:

(1) The percentage of corn-ear worm and mold injury decreases as the number of dustings are increased.

(2) The cost of dusting is prohibitive where corn is grown for grain or forage but is practical where corn is raised for roasting ears, show purposes, or for seed corn.

(3) Sulphur is superior to flour or lime as a carrier for arsenate of lead and there is some indication that it also serves as a fungicide.

(4) Fifty per cent arsenate of lead does not control the corn-ear worm as effectively as does 75 per cent arsenate of lead.

A NEW SPECIES OF ISOSOMA ATTACKING WHEAT IN UTAH¹

By R. W. DOANE, *Stanford University*

During the past two summers, while carrying on certain investigations in Utah, for the American Smelting and Refining Co., Department of Agricultural Investigations, I have had an opportunity to study the life-history and habits of different wheat-infesting *Isosoma*, and to note something of the effect of their work in the wheat fields.

In the so-called dry farm regions in Salt Lake Valley it is a common custom to plant wheat every other year, letting the fields lie fallow during the alternate years. Often, however, the fields are not plowed during the year that they are supposed to lie fallow, but are allowed to grow a volunteer crop which is sometimes more or less profitable. The plowing that is done at any time is usually with a disc plow and a large part of the straw and stubble is left on the surface of the ground.

It will at once be seen that such farm practices offer almost ideal conditions for the development of stem-infesting wheat pests, and it is not surprising to find the *Isosomas* doing an immense amount of injury there, sometimes reducing the crop yield to a small proportion of what it normally would be.

My attention was first called to these pests when I found the adults in considerable numbers in a field of winter wheat in May, 1914. Two species were collected at this time. One proved to be the well known wheat straw worm, *Isosoma grande*, the other species, as far as I can determine, is undescribed. Because the larvæ confine their attacks to the leaf-sheath, I have called the species *Isosoma vaginicum*,

¹Contribution from the Laboratories of the American Smelting and Refining Co., Department of Agricultural Investigations.

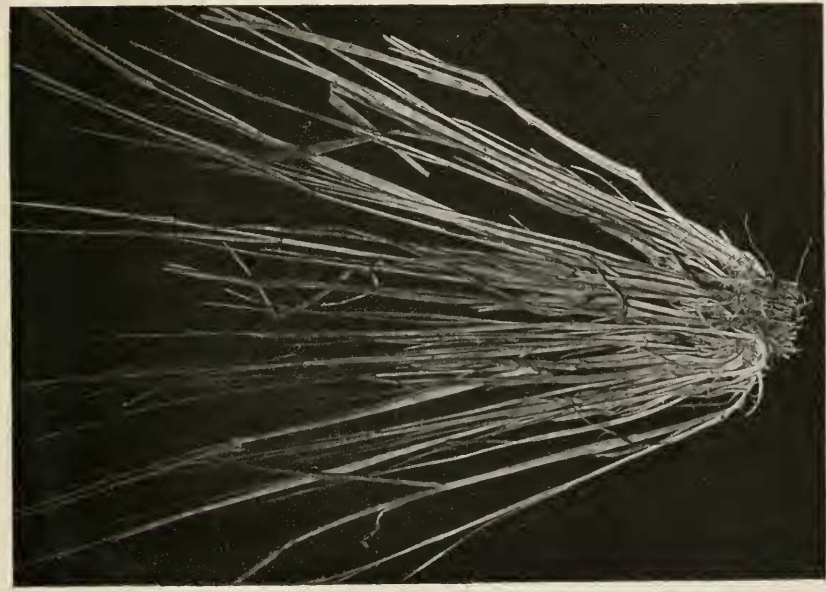


Fig. 1. Young wheat in which nearly all of the stems in the stool have been affected by *Isosoma vaginicornum*.



Fig. 2. Wheat straws that have become distorted on account of the work of *Isosoma vaginicornum*.

and have used the common name of "the wheat sheath worm." A brief description follows:

Isosoma vaginicum n. sp.

Head, wholly opaque black, finely punctate, with fine white pile; antennæ black, basal segments faintly yellowish, especially below, the club somewhat shorter than the three preceding segments taken together, thorax black, finely punctate, in certain lights a faint yellowish spot may be seen on the anterior lateral corner of the prothorax; coxæ and trochanters black; femoræ of the first pair of legs black at base, yellowish toward the tip, in some instances nearly all of the distal half, especially below, is yellowish; femoræ of other legs black, yellowish at tip; anterior tibiæ yellowish, sometimes somewhat darker, especially below; other tibiæ blackish, yellowish at base and tip; tarsi yellow, last segment darker at tip; wings reaching to the tip of the abdomen; abdomen shining black, extreme tip (ovipositor sheath) yellowish; length 3 mm.; wing expanse $5\frac{1}{2}$ mm. to 6 mm.

Isosoma grande, which is found in the same fields as *I. vaginicum*, may easily be distinguished from the latter species by its large size and shining thorax. A few specimens of *I. tritici* were also found in this region. They may be distinguished from *I. vaginicum* by the basal segment of the antennæ being wholly black and the club being

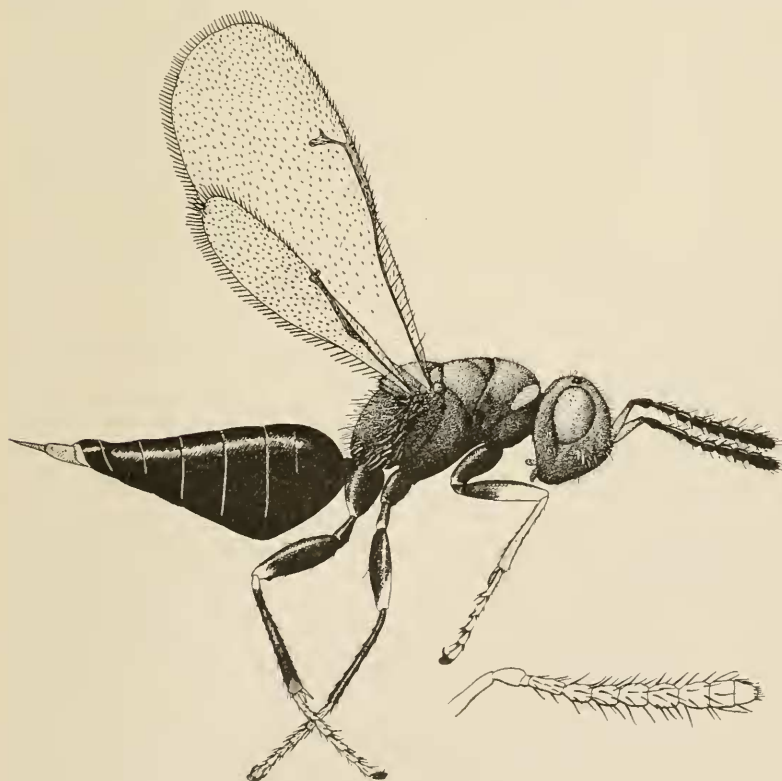


Fig. 23. *Isosoma vaginicum*.